Guneet Singh Dhillon

Curriculum Vitae

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guneet-dhillon.github.io

Education

Oct 2021 - Current **University of Oxford**, Oxford, UK
D.Phil. in Statistics
- **Advisors** : Prof. Arnaud Doucet, Prof. Yee Whye Teh, Prof. George Deligiannidis, Dr. Tom Rainforth
- **Funding** : Clarendon Fund Scholarship, University of Oxford (only 1 awardee from the Department of Statistics)
- **College** : St. John's College

Aug 2014 - May 2018 **University of Texas at Austin**, Austin, TX, USA
B.Sc. in Computer Science with Honors - Turing Scholars Honors
B.Sc. in Mathematics with Honors **GPA: 3.89 / 4.00**
- **Undergrad Honors Thesis** : Training Ising Models on Images using Sparsitron (Advisor - Prof. Adam Klivans)
- **Certificate** : Applied Statistical Modeling
- **Minor** : Economics
- **Research Programs** : Freshman Research Initiative, College of Natural Sciences Directed Reading Program, Department of Mathematics

Work Experience

Jul 2018 - Sep 2021 **Applied Scientist II** (Dec 2019 - Sep 2021) and
Applied Scientist I (Jul 2018 - Dec 2019), *Amazon Web Services, Inc.*, Pasadena, CA, USA
- Developed the algorithm *Uniform Sampling over Episode Difficulty* for few-shot image classification with Prof. Stefano Soatto (NeurIPS 2021 spotlight publication)
- Developed the algorithm *Transductive Fine-tuning* for few-shot image classification with Prof. Stefano Soatto (ICLR 2020 publication)
- Devised algorithms for the *Amazon Textract* product [link] (U.S. patent)
- Devised algorithms for the *Amazon Rekognition Custom Labels* product [link]
- Won prizes for constructing innovative solutions for other products via hackathons

May 2017 - Aug 2017 **Software Development Engineer Intern**, *Amazon Web Services, Inc.*, Palo Alto, CA, USA
- Developed the algorithm *Stochastic Activation Pruning* for robust image classification with Prof. Anima Anandkumar (ICLR 2018 publication)

May 2016 - Aug 2016 **Machine Learning Intern**, *CognitiveScale Inc.*, Austin, TX, USA
- Built a search and recommendation system using probabilistic nonnegative matrix factorization and Gibbs sampling techniques, with Dr. Ayan Acharya

May 2015 - Aug 2015 **Software Technology Engineering Intern**, *Dell Inc.*, Austin, TX, USA
- Implemented a Windows 10 Universal App. to connect and share features between devices

Publications

Dec 2021 **Uniform Sampling over Episode Difficulty** [pdf]
Sébastien M. R. Arnold*, **Guneet S. Dhillon***, Avinash Ravichandran, Stefano Soatto
* Equal contributions
- In Proceedings of **Advances in Neural Information Processing Systems (NeurIPS) 2021 (Spotlight)**

May 2020 **A Baseline for Few-Shot Image Classification** [pdf]
Guneet S. Dhillon, Pratik Chaudhari, Avinash Ravichandran, Stefano Soatto
- In Proceedings of **International Conference on Learning Representations (ICLR) 2020**
- Short version in Proceedings of Workshop on Meta-Learning, Conference on Neural Information Processing Systems (NeurIPS) 2019 (Spotlight)

May 2018 **Stochastic Activation Pruning for Robust Adversarial Defense** [pdf]
Guneet S. Dhillon, Kamyar Azizzadenesheli, Zachary C. Lipton, Jeremy Bernstein, Jean Kossaifi, Aran Khanna, Anima Anandkumar
- In Proceedings of **International Conference on Learning Representations (ICLR) 2018**
- Short version in Proceedings of Machine Deception Workshop, Conference on Neural Information Processing Systems (NeurIPS) 2017

Preprints

Jun 2023 **On the Expected Size of Conformal Prediction Sets** [pdf]
Guneet S. Dhillon, George Deligiannidis, Tom Rainforth

Theses

May 2018 **Training Ising Models on Images using Sparsitron** [pdf]
Undergraduate Honors Thesis
- Advisor : Prof. Adam Klivans
- Co-Advisor : Dr. Philipp Krähenbühl

Patents

Nov 2020 **Structured Document Analyzer** [pdf], U.S. Patent 10,839,245
Guneet S. Dhillon, Vijay Mahadevan, Yuting Zhang, Meng Wang, Gangadhar Payyavula, Viet C. Nguyen, Rahul Bhotika, Stefano Soatto

Other Articles

Sep 2020 **Erratum Concerning the Obfuscated Gradients Attack on Stochastic Activation Pruning** [pdf]
Guneet S. Dhillon, Nicholas Carlini

Talks and Presentations

Uniform Sampling over Episode Difficulty
Feb 2022 Seminar on Continual-Learning/Meta-Learning/Transfer-Learning, DeepMind

A Baseline for Few-Shot Image Classification
Jul 2021 Workshop on Computer Vision with Limited Labels, Amazon Computer Vision Conference
Dec 2019 Workshop on Meta-Learning, Conference on Neural Information Processing Systems (NeurIPS)
Jul 2019 Workshop on Computer Vision Services/Systems in Amazon, Amazon Machine Learning Conference
Jul 2019 Workshop on Data-Efficient Learning Techniques for Amazon Scale, Amazon Machine Learning Conference

Academic Services

Program Committee Member
2022 Conference on Lifelong Learning Agents (CoLLAs)

Reviewer
Conference on Neural Information Processing Systems (NeurIPS)
International Conference on Machine Learning (ICML)
International Conference on Learning Representations (ICLR)
Conference on Lifelong Learning Agents (CoLLAs)
Amazon Machine Learning Conference

Teaching

Teaching Assistant
Oct 2022 - Jan 2023 Foundations of Statistical Inference, Department of Statistics, Oxford *(George Deligiannidis)*
Jan 2016 - May 2016 Matrices and Matrix Calculations, Department of Mathematics, UT Austin *(John Gilbert)*

Honors and Awards

Oct 2021 - Current	Clarendon Fund Scholarship, Oxford *(only 1 awardee from the Department of Statistics)*
Aug 2017 - May 2018	Out-of-State Tuition Waiver, College of Natural Sciences, UT Austin *(only 5-7 awardees)*
Aug 2017 - May 2018	Thomas and Elizabeth Merner Scholarship in Natural Sciences, College of Natural Sciences, UT Austin
Aug 2017 - May 2018	Angus G. and Erna Pearson Endowed Undergraduate Scholarship, Department of Computer Science, UT Austin
Apr 2018	College Scholar, College of Natural Sciences, UT Austin
Aug 2016 - May 2017	Motorola Endowed Scholarship, Department of Computer Science, UT Austin
Apr 2017	College Scholar, College of Natural Sciences, UT Austin
Aug 2015 - May 2016	Angus G. and Erna Pearson Endowed Undergraduate Scholarship, Department of Computer Science, UT Austin
May 2015 - Aug 2015	TIDES FRI Summer Research Fellowship, College of Natural Sciences, UT Austin
Aug 2014 - May 2015	Freshman Scholarship, College of Natural Sciences, UT Austin *(only 5% of freshmen awardees)*
Aug 2014 - May 2015	Schein Memorial Scholarship, Department of Computer Science, UT Austin

Other Research Projects

Jan 2016 - Dec 2017	**Clustering and Prediction in Time-Series Data**, with Dr. Sinead Williamson Clustering time-series data and predicting future values by modeling the data using an infinite mixture of probabilistic auto-regressive models, learned using Gibbs sampling techniques
Nov 2017 - Dec 2017	**Generative Adversarial Networks (GANs) for Adversarial Training** [pdf], course project Robust image classification using a generator-discriminator formulation to train deep networks
Nov 2016 - Dec 2016	**Conflict Graphs for Parallel Stochastic Gradient Descent** [pdf], course project Training SVMs by exploring conflict graphs to parallelize stochastic gradient descent training
Jan 2015 - May 2015	**Genetic Algorithms for Efficient 3D Printing**, Freshman Research Initiative project Minimizing the overhang region in 3D printing using genetic algorithms to obtain slicing planes
Apr 2015 - May 2015	**Efficient Thread Scheduling**, course project Reducing the wait-time for threads by scheduling them based on past CPU and I/O times

Coursework

Audited Courses Oxford, 2021-22	Algorithmic Foundations of Learning *(Patrick Rebeschini)*, Computational Learning Theory *(Varun Kanade)*, Theories of Deep Learning *(Jared Tanner)*
Audited Courses Caltech, 2018-20	Linear Algebra and Convexity *(Joel Tropp)*, Foundations of Machine Learning and Statistical Inference *(Anima Anandkumar)*, Foundations of Machine Learning *(Anima Anandkumar)*
Graduate Courses UT Austin, 2016-18	Convex Optimization *(Constantine Caramanis)*, Linear Models *(Peter Müller)*, Numerical Analysis: Linear Algebra *(George Biros)*
Undergraduate Courses UT Austin, 2014-18	Machine Learning / Vision: Honors *(Kristen Grauman)*, Artificial Intelligence: Honors *(Peter Stone)*, Honors Statistics: Honors *(James Scott)*, Geometric Foundations of Data Science *(Chandrajit Bajaj)*, Introduction to Data Mining *(Adam Klivans)*, Introduction to Stochastic Processes *(Stephen Walker)*, Introduction to Quantum Information Science *(Scott Aaronson)*, Randomized Algorithms *(David Zuckerman)*, Algorithms and Complexity: Honors *(Eric Price)*, Differential Equations with Linear Algebra: Honors *(Dan Knopf)*, Real Analysis I *(Hector Lomeli)*, Computational Intelligence in Game Research / Design I & II *(Cem Tutum)*, Introduction to Probability & Statistics *(Sinead Williamson)*, Matrices and Matrix Calculations *(John Gilbert)*, Financial Economics *(Svetlana Boyarchenko)*, Introductory Game Theory *(Dale Stahl)*, Microeconomic Theory *(Gerald Oettinger)*, Principles of Computer Systems: Honors *(Ahmed Gheith)*, Computer Organization & Architecture: Honors *(Ahmed Gheith)*, Discrete Math for Computer Science: Honors *(Isil Dillig)*, Data Structures: Honors *(Calvin Lin)*, Competitive Programming *(Etienne Vouga)*

Other Activities

Oct 2021 - Current	Member of the Clarendon Scholars' Association, Oxford
Aug 2014 - May 2018	Member of the Turing Scholars Student Association, UT Austin
Aug 2014 - May 2018	Member of the Sikh Student Association, UT Austin
Aug 2016 - May 2017	School Relations Director for the Undergraduate Machine Learning Labs, UT Austin
Oct 2016	Secured seventh position in the Electronic Trading Challenge, UT Austin
Jan 2015 - May 2016	Member of the Texas Table Tennis Team, UT Austin with an NCTTA Rank of 689
Feb 2016	Secured fourth position and an honorable mention in the dataHACK, UT Austin
Aug 2014 - Dec 2015	Member of the Longhorn Cricket Club Team, UT Austin